purposes of trade, that many a trader not worth a shilling, will involve himself to the extent of several hundreds of pounds in putting in a breast-summer, and destroying all the stability of a good house, for the reinstatement of the damage to which he would be unable to pay.

Besides the shrinkage and deflexure of wood breast-summers, their liability to rot and to burn must be added; and if they be made of cast-iron, though they will not shrink or rot, yet when fire happens, they are (though said to be fire-proof) still more disastrous and less certain than those which are of wood.

Breast-summers of stone could hardly under any circumstances be relied upon.

The growth of the evil admission of breast-summers, of wood or of iron, has even lately extended largely into public buildings; hence we see the backs of porticos, raised upon high basements, fractured and sinking; and we observe them in many other situations, where a Wren, or other constructor who never lost sight of science, would have shuddered to use them.

The inconveniences resulting from the fracture of brickwork over breast-summers, for a long while caused the author very serious trouble: in all the examples where he used them, he had the timber cambered considerably, so as to counteract any of the effects of ordinary sinking; but this did not prevent fracture of the walling over the ends of the timber: it was a long while before it occurred to him, that this destructive effect was caused almost wholly by the shrinkage of the timber.

In forty instances where he used timber window-heads over the windows of printing-offices and manufactories, he found thirty-two instances of fracture: but in all these instances the posts between the windows were framed in one length from one window-head to another, and were braced or trussed between, so that though the brickwork became fractured outwardly, after the flaws were carefully stopped, no further inconvenience was suffered: in some of these instances it is true that the fracture was scarcely discernible; but the author has seen instances of heavy timber window-heads tier above tier, which have collectively so shrunk, that the brickwork over the upper windows sunk and fractured two and a half inches.

Influenced by the injury and disfigurement caused to brickwork by the shrinkage of breast-summers, the author has lately thought of a method of counteracting it: it is simply to slant off the ends of a timber breast-summer or of a window-head, as much as the quantity which it may be expected to shrink; and to place a plate of wrought-iron (or several bars of wrought-iron) out of level upon the slanting part of the brick pier at the end of the timber; and to build the brickwork over the breast-summer or window-head of the same form as the upper side of the timber, that is, out of level for about two or three feet next the ends of the wood.

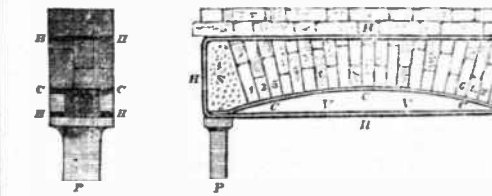
b. Breast-summer or window-head of timber.
d. Part of ditto slanted off.
f. A plate, or several bars of wrought-iron, laid upon the slanted part of the timber, and resting also upon the brick pier.
h. Part of the brick-work, which throughout the whole height of the work is to be laid to the same slope as the timber.
Note. The slant must increase with the height and number of the breast-summers or window-heads: otherwise the upper timbers will sink more than the allowance.

b. The thickest part of a timber breast-summer or window-head when so shrunk that *d* and *e* are level.
d. Slanted part of the timber.
f. Plate or bars of wrought-iron become level by the shrinkage of the timber, and leaving a vacancy above the timber.
h. Courses of the brickwork become also level.

The object of this seeming malformation is, that when the wood has shrunk to its smallest dimensions, the top of the breast-summer or window-head may be exactly level with the top of the pier; and the iron upon which part of the brickwork will be supported having moved like a floating bridge with the fall of the tide, will also become level, leaving a small triangular crevice between it and the end of the timber, which, when shrinkage has ceased, may be stopped by a wedge: and thus the shrinkage of timber will cause the courses of the brickwork to settle level, instead of causing them to fracture, sink, and become distorted.

But as the author conceives that the use of breast-summers is scarcely honourable in architecture, under any circumstances, and under any form, and of any materials, he recommends the discarding of them altogether upon every possible occasion; there can rarely be any plea for the use of them besides absolute necessity, or the modern false taste of supporting a heavy upward mass of fabric upon scarcely any thing apparent.

The author has lately used, for the reception of walls which could only admit supports at their ends, a kind of breast-summers (or rather arches) composed of brickwork, with stone abutments, and the whole contained within two long hoops of wrought-iron: and this has proved successful; for provided the hoops be



Section. *Elevation.*

P. P. &c. Story-posts of iron to be first let into the old brick-work.
H. Hoop of wrought-iron, welded completely and inserted in the brick-work, no more of the old work being removed than will be sufficient to admit the iron. When the hoop is inserted on one side of the wall, a second similar hoop is to be cut out for and inserted on the other side of the wall.
C. &c. Cradle-bars of wrought-iron which are to be cut out for and inserted within the hoops.
S. Skew-back of stone which is next to be inserted within the hoops.
1, 2, 3, 4, 5, 6, &c. The order in which the old brick-work is to be gradually removed, and to be replaced by a well-bonded arch of brick-work set in Parker's cement.
V. &c. Vacancy which may be eventually left between the hoops and the cradle-bars.
The old work between the story-posts is not to be removed till after all the other processes are complete.
If this mode be adopted in new work, much of the trouble and caution will be unnecessary.
The two hoops should be pitched over, to prevent corrosion: and some cross ties may be used, in order to prevent the two hoops from moving further apart.

completely welded together, and be sufficiently strong, and the arch be bonded so closely as to admit of no settlement, neither expansion nor sinking to any sensible degree can take place: this trial proving successful, he has since employed the same means in an old building; whereby much of the trouble, expense, and inconvenience of shoring were saved. In adopting this method in old buildings, success will depend upon the care and address with which the work is performed.*

The author also suggests the following

P. P. Story-posts of iron to be first inserted.
S. *s.* Skew-backs of stone to be in succession inserted.
A. Arch which is to be formed piecemeal, only a small part of the old work being removed at once.
G. Gothic arch, which may on some occasions be preferred to the one last described.
W. *w.* &c. The old wall upon which the arch is to first marked out, and into which the arch is to be afterwards cut
p. p. Minor story-posts of iron, which may be afterwards inserted if required.
a. b. c. Arched work instead of a breast-summer formed as described in § 563.
T. t. Wrought-iron tie, to prevent the arch and the story-posts from expanding.

* The author lately adopted this mode successfully at the premises of Messrs. Errington, St. Paul's Churchyard, London: part of a back-front was to be removed, and though that was no reasons so to be almost ready to fall, the new work was inserted with only the use of half the usual quantity of shoring: and the operation caused no damage whatever to the work above.